"IDENTIFICATION AND PLANNING OF PARKING SYSTEM IN BGSBU CAMPUS"

Submitted In partial fulfillment of the requirement of the degree of

BACHELOR OF TECHNOLOGY
IN
DEPARTMENT OF CIVIL ENGEERING, SOET

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CONTENTS

Introduction:

Parking is the act of stopping and disengaging a vehicle and leaving it unoccupied. Proper design of parking space is very important for good transporting system In this study we are going for the design or develop the parking facilities for our university campus at various location, thus providing the solution for the congestion of the traffic or other problems which are faced by the university employees and students for parking their vehicles.

Types of parking

- There are two types of parking
- i) on street parking
  ii) off street parking

i) on street parking:

On street parking means the vehicles are parked on the sides of the street itself. This will be usually controlled by government agencies itself it is of two types
a) parallel parking
b) angle parking

a) Parallel parking

The vehicles are parked along the length of the road. Here there is no backward movement involved while parking or unparking the vehicle. Hence, it is the most safest parking from the accident perspective.
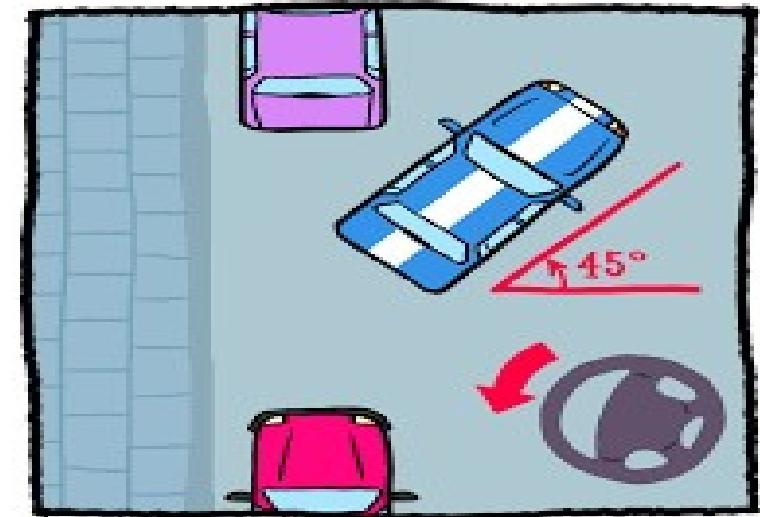
Types of angle parking

- i) 30*   ii) 45*

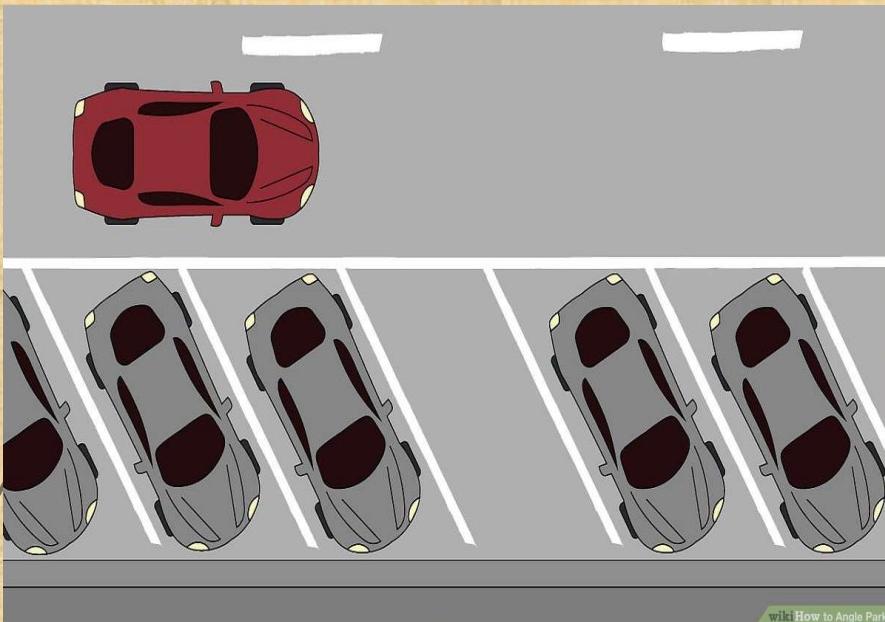figure: 30* Parking   figure: 45* Parking

iii) 60*

figure: 60* Parking

iv) 90*

figure: 90* Parking

ii) Offstreet parking

In many urban centers, some areas are exclusively allotted for parking which will be at some distance away from the main stream of traffic. Such a parking is referred to as off-street parking.

They may be operated by either public agencies or private firms.

TYPES OF OFF STREET PARKING

a) Surface car parks

b) Roof parks

c) Mechanical parks

d) Underground car parks

Parking demand characteristics

- There are four types of characteristic demand;

- a. Parking accumulation :
It is defined as the number of parked vehicle at specified time is called parking accumulation.

- b. Parking duration :
Parking duration is defined as the length of the time for which vehicle uses the facility.

- c. Parking volume :
Parking volume means number of vehicle involved in parking activity is called parking volume.

- d. Occupancy :
It is defined as the ratio of the number of vehicles using parking facility to the number of parking facility available at a specified time.

PCU (Passenger car unit) :

➡ PCU is an interface value which is being used to change a vehicle in to its equivalent to it Passenger car unit. The equivalent PCUs of different vehicle categories does not remain same under different categories. According to IRC-106 following are the PCU value of the different vehicles.

PCU Factor For Different Type Of Vehicle	
Vehicle type	**PCU**
Fast vehicle	
1. Two wheeler motor cycle or scooter etc	0.5
2. Passenger car pick up van	1.0
3. Auto rickshaw	1.2
4. Light commercial vehicle	1.4
5. Truck or Bus	2.2
6. Agricultural tractor trailer	4.0
Slow vehicle	
1. Cycle	0.4
2. Cycle Rickshaw	1.5
3. Tonga (horse drawn vehicle)	1.5
4. Hand cart	2.0
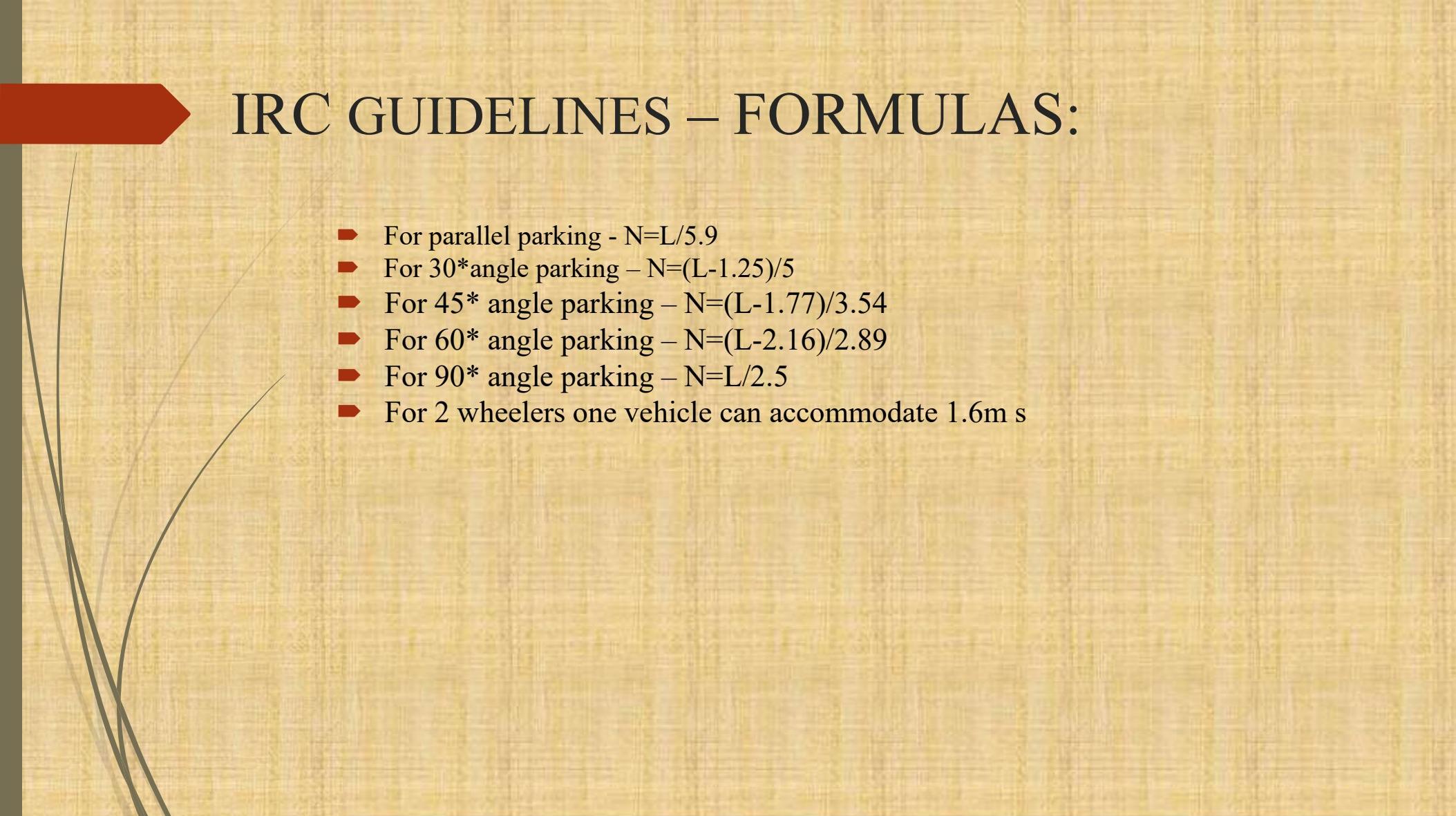
IRC GUIDELINES – FORMULAS:

- For parallel parking - $N=L/5.9$
- For 30*angle parking – $N=(L-1.25)/5$
- For 45* angle parking – $N=(L-1.77)/3.54$
- For 60* angle parking – $N=(L-2.16)/2.89$
- For 90* angle parking – $N=L/2.5$
- For 2 wheelers one vehicle can accommodate 1.6m s

LITERATURE REVIEW

Prof. Deepak Tiwari et.al in 2013; His paper conducted that during weekends and public demands for vehicle parking exceeds the supply and consequently, has a negative impact on retail salesand not only that but causes severe dissatisfaction while shopping. This paper studies the different aspects of external variables that influence the satisfaction of the buyer for purchasing. The study is descriptive in nature and self-designed to collect primary perception was used. Retailers and consumers were asked their views on the switch in the market area that can be easily done the existing policy, maximum parking and the remote parking which is an attempt to explore matters relating to the above parameters.

Parmar.et.al 2016 Studied high vehicles ownership and poor transport facilities specially in the cities where the population between 1 to 2 million. The demand for parking has increase in alarming proportion in Central Business District (CBD) areas and other work or activity centers of the cities. This study focused on parking demand by collection of parking data, such as parking demand, parking accumulation, rate of turnover, to check the feasibility of paid parking service as well as it response on the mode shift of the two wheeler parkers. Feasibility of pay and park facility on two busy street "M.G.Road", "MayFair Road" have been studied in this research work. The detail license plate surveying method and fixed period sampling method are used for analysis of survey data. This study also includes the In-Out survey or personal interview of people using the on-street parking at these two busy streets. In the study, On-street parking demand is very high in the study area on M.G.Road and MayFair Road for most part of day, but turnover is very poor, which reflects over occupancy of prime urban space for longer duration.

Objectives

- 1) To study Traffic volume for our university campus.

- 2) To identify various parking slots/zones at our university campus.

- 3) To develop an outline map for the design of parking facilities inside university campus which will be accessible to all the departments. Hence thereby reducing traffic congestion/accidents on roads and thereby providing recommendation and suggestion for the same

Methodology

There are two types of method for data collection

a) Beat survey

b) Continuous survey

Beat survey

- To accommodate at least six to eight beats the data is analyzed to determine(for each vehicle) the number of vehicle is taken as nI*beat duration. If such a vehicle pass through nj beats then the parking duration will be at least nj*beta duration. The arrival rate of vehicle between second and third beats with the beat duration is 't'.

Continuous survey

➭ In continuous survey initially we use to note down the distinguish feature of the vehicles. Then we note down its arrival time and departure time at the entry place. Then parking duration will be equal to the difference between departure time and arrival time. Then we have to find out dimension of the shopping area. We should measure the approximate length and width of the shopping area.

We have identified the requirement of parking of various departments in bgsbu campus and we have used continuous method for data collection in bgsbu campus

figure: surveying work at SOET department   figure: surveying work at ERE department   figure: surveying work at biodiversity department

- We have done 7 days traffic survey and collected data of SOET of two and four wheelers
The below given table shows the PCU calculation for two days and similarily we can
calculate it for the rest of days

TIME	2-Wheeler	4-Wheeler	PCU	TIME	2-Wheeler	4-Wheeler	PCU
8.30am	0	0	0	8.30am	1	0	0.5
8.45am	2	0	1	8.45am	1	1	1.5
9.00am	7	5	8.5	9.00am	5	9	11.5
9.15am	16	8	16	9.15am	18	13	22
9.30am	25	11	23.5	9.30am	26	18	31
9.45am	29	17	31.5	9.45am	31	22	37.5
10.00am	33	23	39,5	10.00am	29	24	38.5
10.15am	29	19	33.5	10.15am	36	27	45
10.30am	31	24	39.5	10.30am	37	23	41.5
10.45am	32	23	39	10.45am	33	29	45.5
11.00am	29	27	41.5	11.00am	30	30	4
11.15am	28	26	40	11.15am	31	28	43.5
11.30am	29	25	40	11.30am	29	26	27.5
11.45am	27	22	35.5	11.45am	28	25	39
12.00pm	24	24	36	12.00pm	26	24	37
12.15pm	26	23	36	12.15pm	27	23	36.5
12.30pm	27	22	35.5	12.30pm	24	22	34
12.45pm	25	21	33.5	12.45pm	25	23	35.5
1.00pm	24	23	35	1.00pm	23	22	33.5
1.15pm	23	19	30.5	1.15pm	22	21	32
1.30pm	21	19	29.5	1.30pm	21	18	28.5

Day 1ˢᵗ   Day 2ⁿᵈ

Proposed parking pattern for various departments
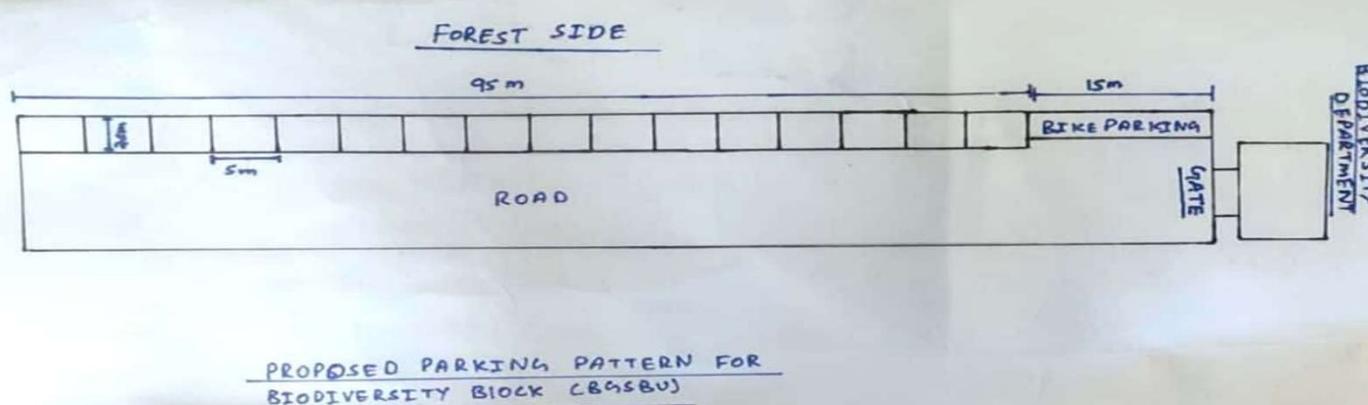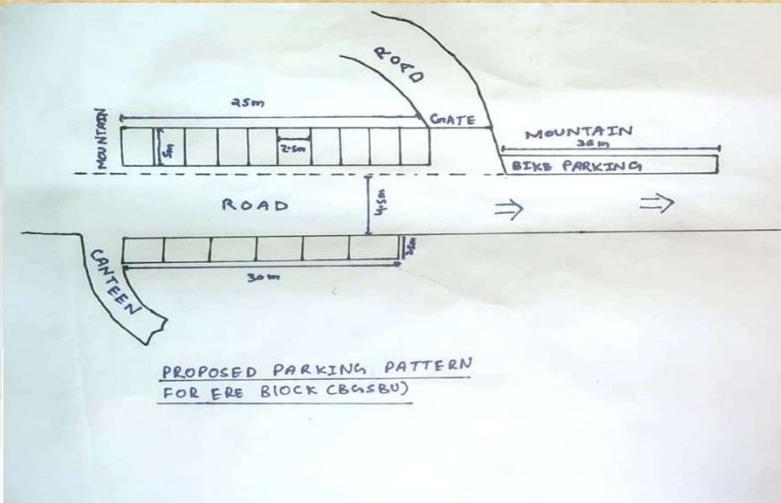
RECOMMENDATIONS:

1 FOR SOET DEPARTMENT

The total no. of 4 wheeler vehicles we park as per IRC is 29, but our peak value as per traffic survey is 30, so there is shortage of one vehicle.

The total no. of 2 wheeler vehicles we park as per IRC is 28, but our peak value as per traffic survey is 37, so there is shortage of space, we recommended that the left side of the workshop road should be extended longitudinally for parking, so that there should be sufficient space for parking of 2 wheelers.

2 FOR ERE DEPARTMENT

The total no. of 4 wheeler vehicles we park as per IRC is 15, but our peak value as per traffic survey is 26, so there is shortage of space, we recommended that the mountain side below the R&D labs should be cut so that there should be sufficient space for parking of 4 wheelers.

The total no. of 2 wheeler vehicles we park as per IRC is 22, but our peak value as per traffic survey is 30, so that there is shortage of space, we recommended that the left side of soet road should be extended longitudinally for parking, so that there should be sufficient space for parking of 2 wheelers.

3 FOR BIODIVERSITY DEPARTMENT

The total no. of 4 wheeler vehicles we park as per IRC is 18, but our peak value as per traffic survey is 16, so that there is shortage of space, we recommended that the parking space for should be extended by the side of road, so that there should be sufficient space for parking of 4 wheelers.

The total no. 2 wheeler vehicles we park as per IRC is 16, but our peak value as per traffic survey is 18, so that there is sufficient space for parking of 2 wheelers.

4 FOR TOURISM DEPARTMENT

The total no of 4 wheeler vehicles we can park as per IRC is 26 but our peak value as per traffic survey is 26,so there is no shortage of space for 4 wheeler

The total no of 2 wheeler vehicles we can park as per IRC is 30 but our peak value as per traffic survey is 30, so there is no shortage of space for 2 wheeler.

Conclusion

➡ From the survey in the BGSBU, we come to a conclusion that the parking facility or parking space is not so much good and as per our traffic survey we find out the traffic density in our BGSBU campus is increasing day by day which occurs lack of space in our university.

➡ From the studies and survey, we gave some recommendations in our project that how we should overcome from these parking problems. If the University follows and studied these recommendations then definitely we should resolve the parking issues in our university which helps us to minimize the effects of parking upon road safety and congestion. This also helps us to upgrade where practicable all council car parks to "secured car park" standard with in 5 years and to review the operation and enforcement of the council's car parks to ensure they operate in support of the council's objectives, generic enforcement policy.

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